

## Appendix E - Natural and Human Environment

The following information pertaining to the natural and human environment within the study area was gathered by reviewing information found in existing documents and incorporating updated information submitted by various resource specialists.

### **Integrated Natural Resource Evaluation of the Toklat Basin**

The National Park Service is presently undertaking a comprehensive resources study in the Toklat Basin, an area that encompasses a large portion of the study area for the North Access Visitor Facilities Study. This integrated natural resource evaluation will collect baseline data on the occurrence and distribution of vascular and non-vascular plants, terrestrial invertebrates, amphibians, selected species of birds (passerines, near-passerines, and upland shorebirds), and selected mammalian species (small mammals, hares, ground squirrels, marmots, and furbearers). Additional evaluation components include surficial geological mapping and sound quality data collection and analysis.

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### **Climate**

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Denali National Park and Preserve straddles two of the four major climatic zones of Alaska – the transitional maritime zone south of the Alaska Range and the continental zone in the Interior north of the range. The Alaska Range exerts a major influence on the climate of the Interior by blocking much of the moisture that sweeps inland from the Gulf of Alaska. Therefore, the north side of the park and preserve is characterized by less precipitation and greater fluctuations in temperature (hotter in summer and colder in winter) than the south side.

Temperatures generally decrease with increasing elevation, except in winter when there are often temperature inversions with colder air flowing down the mountains and settling into valley bottoms. Extreme conditions can be expected on the flanks of Mount McKinley where temperatures as low as –70 degrees Fahrenheit (°F) have been recorded.

Climatic data collected at Healy, east of the Stampede Road alignment at 1,490 feet in elevation, indicate a mean annual temperature of 30.1°F. Mean January temperature is 4.8°F. Mean July temperature is 59.5°F. Average annual total precipitation is 14.8 inches, and the annual mean snowfall average is 78.5 inches.

Climatic data is now being recorded at the Stampede airstrip along the Stampede Road alignment, approximately 45 air miles west of the George Parks highway, at 1,800 feet in elevation. The station was deployed in April of 2003. The mean July temperature for 2003 was 56.1°F. The 2004 mean January temperature was 0.5°F. The high temperature for 2003 was 83.6°F and the low temperature was –37.2°F. The average snow depth for the 2003-2004 winter season is 20 inches (amount of snow measured on the ground at the end of each month, November-April). This information is based solely on data collected in 2003 and 2004.

Climatic data collected at the Wonder Lake Ranger Station, four miles southeast of Kantishna and 300 feet higher in elevation, indicate a mean annual temperature of 29°F. Mean January temperature is 2°F. Mean July temperature is 55°F. The average snow depth for Kantishna is

19.4 inches (amount of snow measured on the ground at the end of each month, November-April).

The study is located near 64° north latitude and experiences strong seasonal fluctuations in incoming solar radiation with nearly 21 hours of daylight on the summer solstice and only about 4 hours of daylight on the winter solstice. The brief winter sunlight, coupled with persistent snowcover that prevents absorption of heat, results in extreme cold temperatures, regularly below 0°F in winter.

Throughout the study area winds vary greatly in direction and intensity. The prevailing wind direction in all seasons is from the northwest, though maximum velocities normally come from the southwest. Above treeline, in the open tundra expanses, wind is a dominant feature and snowcover in this area is often minimal due to wind scour. Valley bottoms and riparian zones with a spruce-dominated landscape are often protected from the wind, and could have potentially more snow on the ground than surrounding higher elevations.

The extreme winter and summer climatic conditions heavily influence the visitation rates and the types of visitor activities. The long daylight hours and warm temperatures of summer enhance recreational opportunities and the number of overnight stays related to camping, hiking, and river use. In winter, the periods of extreme low temperatures and wind restrict recreational activities in the area to primarily day use with limited numbers of visitors camping. Nonetheless, opportunities to use trails are greater in the winter due to frozen ground and snow cover. Winter recreational activities in this area include dog mushing, snowmachining, cross-country skiing, skijoring and snowshoeing.

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## **Geology and Soils**

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### **Physiography**

The northern foothills of the Alaska Range consist of a series of east-west trending ridges, starting with the Kantishna Hills and running eastward. Summit altitudes range generally between 2,000 and 4,500 feet. The foothills vary from 3 to 7 miles wide and from 5 to 20 miles long (Wahrhaftig, 1965). Broad flat valleys of glacial origin that range from 2 to 10 miles wide separate the foothills.

The geology of the Kantishna region remains dynamic and is seismically very active. Earthquakes rattle the area frequently and are most likely uplifting it as well. Wahrhaftig postulated that during the last 2-3 million years the uplift of the Alaska Range is in the order of 5,000 – 6,000 feet. The Kantishna Hills appear to have been lifted as much as 3,000 feet above the Nenana Gravel Surface in that time.

Rocks comprising the Kantishna Hills are geologically old, but the age of the hills is relatively young. Kantishna Hills are mostly composed of very old metamorphosed sedimentary rocks that have been highly folded and faulted. These rocks have been pushed up as foothills of the Alaska Range in comparatively recent geologic time.

The Birch Creek Schist makes up the majority of the hills. This formation is comprised of thin bedded schists and hard quartzites (Capps 1918). The crest of Kantishna Hills is composed of the Spruce Creek Sequence that is composed of marble, quartzite, graphic phyllite, meta-felsite, meta-andesite, and diorite. Much more recent igneous rocks have intruded the Birch Creek Schist and the Spruce Creek Sequence with dikes and stocks. These formations are part of a large complex of rocks, which make up the bedrock for much of central Interior Alaska.

### **Glacial Geology**

The shifts to and from the ice ages have had a dramatic effect on the landscape in this entire area. The glaciers scoured some areas, while simultaneously burying other areas. On the north side of the Alaska Range beyond the existing glaciers, morainal and glacial outwash deposits extend into the foothills belt and cover large areas of bedrock. Except for some valleys, the foothills section was never glaciated.

The Moose Creek side of the Kantishna Hills has been repeatedly glaciated, but the evidence for the older glaciers has been buried or eroded by the younger glaciers. The Muldrow Glacier straightened the south fork of Moose Creek valley, then jammed up against the south sides of the Kantishna Hills and carved out the Wonder Lake basin.

### **Mineral Resources**

The Denali region provides significant possibilities for mineral deposits (NPS 1981, Bundtzen 1983, Salisbury and Dietz 1984). Most of the past mining activity has been located in the Kantishna Hills in the Yukon-Tanana terrane in northern foothills region and Dunkle Mine area in the Chulitna terrane of the Alaska Range.

Regional metal mining and prospecting during the early part of the twentieth century were dominated by placer gold mining. Other metals were mined in association with gold to a limited extent in the Kantishna area. The Stampede Mine, located approximately 45-miles along the Stampede Trail west of the George Parks Highway, was yielding 2,400 tons of ore yielding 1,300 tons of metallic antimony. The need for critical metals to support World War II efforts made the Stampede Mine Alaska's primary producer of this metal and one of the largest in the country (Brown 1991). From the early 1970s to recent years, a renewed interest in placer mining has been evidenced in this region, particularly in the Kantishna Mining District. This area encompasses an elongated 40-mile, northeast-trending mineralized belt known for silver and gold polysulfide crosscutting veins, placer gold deposits, and antimony and base metal lodes.

The north park boundary encompasses the western most portion of the Nenana coalfield. Coal production began in the Healy area in 1920, and today the Usibelli Mine produces more than 700,000 tons annually.

Nonmetallic materials including sand, gravel, limestone, perlite, clay, haydite, shale, and argillite occur throughout the region. Several areas outside the park boundary contain sedimentary basins and have been identified as possible petroleum provinces. There is also an interest in coalbed methane.

**Soils**

Soils within the study area vary according to climate, parent material, topography, and vegetative cover. In 2002 the Natural Resource Conservation Service completed a six-year soil survey and mapping project containing soil interpretations for planning and potential development. Findings show that the development and use restrictions due to soil properties range from severe to moderate throughout most of the study area. These facts present important environmental constraints for resource management and general development plans. Erosion control measures would be necessary for any future development plans. Refer to the table on the following page for a brief description of the soil units found within the ten locations identified in the visitor facilities study.

**Permafrost**

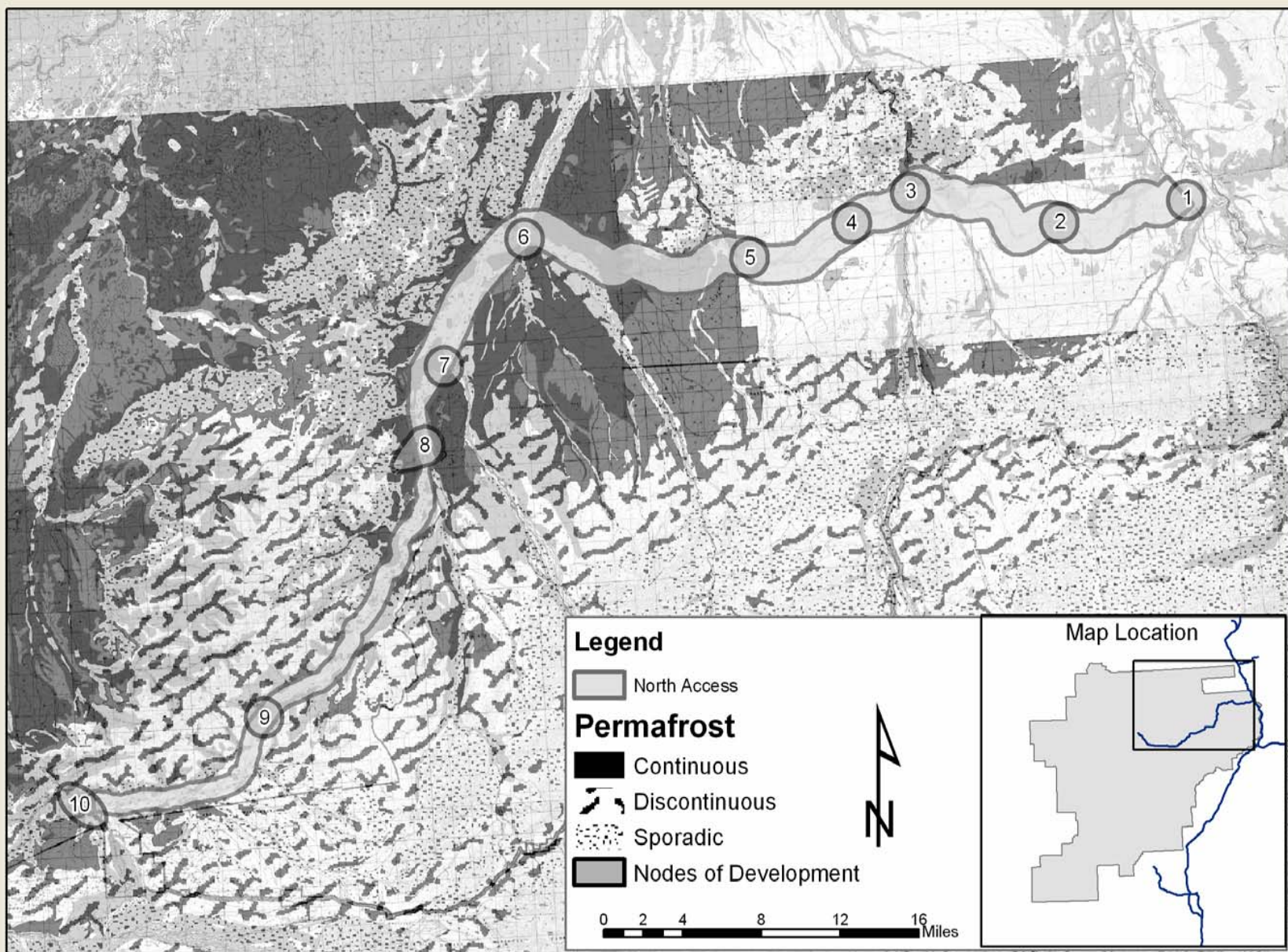
Permafrost, where ground temperatures are below 32°F for at least two years, occurs in most areas of Denali National Park and Preserve. Permafrost is discontinuous (50-90% of area), relatively warm (30-32°F), and of low ice content (0-10% excess ice) in the Tanana-Kuskokwim Lowlands, northern foothills, and the Alaska Range (Ferrians 1965, Ferrians et al. 1969, Brown et al. 1979). There are, however, some isolated areas of permafrost with moderate ice contents in the Tanana-Kuskokwim Lowlands, which makes the terrain more susceptible to thermokarst. In these areas, permafrost typically is found in wet, low-lying areas with fine-grained soils, on steep north-facing slopes and at high elevations. Exact permafrost thicknesses have not been documented, but thicknesses of up to 100 feet have been recorded near the eastern entrance to the park. Refer to the map on page 68 for an overview of permafrost throughout the study area.

Any recreational development in the study area requiring trails, roads or structures must be carefully sited and engineered to avoid or adjust for permafrost soils. Wet, unstable soil conditions and high susceptibility to erosion are the main concerns.

### Soil Units Table

A total of five different soil units are found throughout the ten locations identified in the visitor facilities study. The last column identifies the locations where each soil unit is found.

Soil Unit	Slopes	Vegetation	Permafrost	Landscape Limitation	Major Soils	Applicable Locations in Visitor Facilities Study
Alpine Basins	0-2%	Alpine scrub/tussock; riparian alder-willow, wet meadow; cottongrass tussock	Continuous (+80 percent of landscape)	Permafrost and thermokarst	Permafrost (Note: Ice masses observed to be several meters thick; soil matrix 60-80% ice by volume.)	2, 4
Alpine Low Mountains-Nenana Gravels	10-35%	Alpine scrub types with dwarf aspen/poplar forest	Discontinuous (50-80 percent of landscape)	Combination of permafrost and slope instability following disturbance	Scrub (slopes 0-20%; poorly-drained; permafrost; acidic) Steppe (slope >20%; well-drained; no permafrost; moderately acidic)	1, 4, 6
Alpine Mountains-Schist	20-90%	Alpine scrub and dwarf scrub; ericaceous scrub	Discontinuous (30-50 percent of landscape)	Slope and permafrost	Well-drained in nonpermafrost areas; shallow over fractured weathered schist; very acidic; poorly drained in permafrost areas	3, 6, 7, 8, 9, 10
Boreal Flood Plains	0-2%	Riparian scrub and forest; dwarf spruce forest; tussock and shrub birch	Discontinuous (20-40 percent of landscape)	Flooding and permafrost; some thermokarst	Gravelly flood plain soil; calcareous; loamy terrace soil with permafrost; dwarf spruce woodland	3, 5, 6, 7, 8, 10
Boreal Slopes	0-15%	Dwarf spruce forest, cottongrass tussock, serial scrub	Discontinuous (60-80 percent of landscape)	Permafrost	Permafrost; acidic; recently burned-no permafrost (Note: Ice volume in permafrost soils measured at 60-70 percent.)	4, 5, 6, 7



Permafrost is found in many locations along the Stampede Road alignment.

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## Water Resources

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There are three major watersheds on the north side of the Alaska Range that are drained by the Nenana River, Kantishna River, and North Fork of the Kuskokwim. Prominent tributaries on the north side of the Alaska Range include the Teklanika, Toklat, and McKinley. These large, braided streams originate from major glaciers and are characterized by high turbidity from the glacial silt, seasonal discharge that typically reaches its peak during mid summer when snowmelt in the higher mountains is greatest, and distinct day to night differences. Because of the high sediment load, the gravel riverbeds are highly braided, channel migration is active, and the area of barren, gravel riverbed tends to be extensive, sometimes extending more than two miles wide.

Clear streams also are common throughout the area, originating from headwaters of mountainous areas without glaciers and from small watersheds in moraines and lowlands. Peak flow typically occurs during early-summer snowmelt or with late-summer storm events. On the north side, prominent clear water streams include Bearpaw River, Stony Creek, and Moose Creek, which have extensive watersheds in the foothills of the Alaska Range.

The annual ice-free period for the streams in the study area usually begins by mid-May and lasts until mid-October, when the streams usually freeze up for the winter. Higher flows commonly occur during the spring snowmelt period (mid-May to mid-June) and during summer when runoff from precipitation events is common. During winter, stream discharge is at its lowest. Streams freeze on the surface but continue to flow at greatly reduced rates beneath the ice and via sub-channel discharge. Overflow occurs in some areas. During low flow times, streams are generally fed by groundwater. Minimum stream flow is reached between February and March as the groundwater supply is depleted as the surface freezes.

### Water Quality

The surface waters of Denali National Park and Preserve, particularly in the backcountry, are generally pristine and have not been affected by development. Exceptions are mainly in the Kantishna Hills because of past mining and mining-related activities. Most surface waters in the backcountry received little recreational use because of difficult access, challenging boating conditions, or lack of fisheries.

Except in the Kantishna Hills, nearly all surface water is potable, although iron is sometimes present in undesirable quantities. However, boiling of surface water is considered necessary due to the presence of *Giardia*.

### Flooding

The magnitude, duration, and frequency of floods on large and small streams in the study area are not well known because streamflow records are short or periodic, and there are few gauging stations. In general, floods commonly occur in spring from snowmelt or in mid-summer from rain and glacial runoff. The most severe floods typically occur from rain concurrent with high elevation snowmelt during late summer. Floods during early spring can be aggravated by ice jamming.

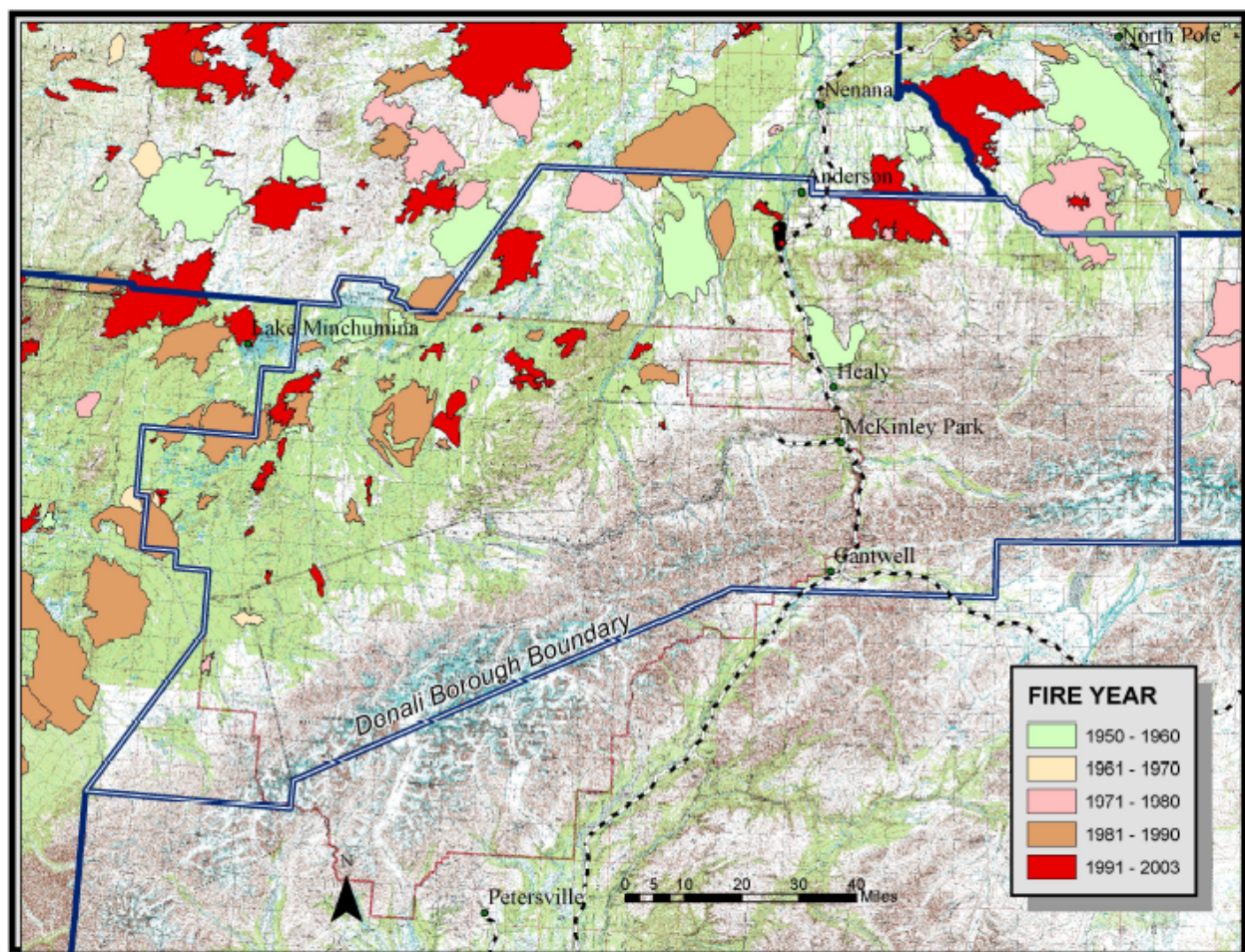


Flood-waters add warmth to the ground, which promotes thawing of permafrost, which, in turn, can cause “thaw ponds” and areas of unstable topography. Thus, large floods can cause substantial changes in topography, beyond just depositions of new alluvium.

The likelihood of periodic flooding along the main river channels must be considered in all phases of human activity in the bottomlands. In addition, the extensive permafrost and large, braided, glacier-river bottomlands provide the ingredients for very rapid rises in water levels with heavy rains or warm spring weather. Recreational river access development should be planned for flexibility in response to changing river flows. Bridge construction could be considered to facilitate river crossings at some locations along the Stampede Road alignment.

## Fire

Wildfires are a natural component of the ecosystem processes in interior Alaska. The study area and surrounding region has a history of naturally-occurring fires, as well as human-caused fires. Evidence of burns can be found in many places within the region. Refer to the map below for an overview of fires that have occurred in the Denali Borough since the 1950s.



Map of fires occurring within the Denali Borough from 1950-2003.



Fires reduce the vegetative cover, which results in warmer soils and deeper thawing of the permafrost layers. This can cause portions of the ground surface to either rise or subside, resulting in hummocky terrain. In following years, the low spots may fill with ice and water and trees may tip as a result of the unstable conditions.

The black spruce woodland areas are particularly susceptible to fire, due to their density, high percentage of dead, lower branches and inherent flammability. A forest with varying stages of growth is healthier and ultimately establishes more diversified wildlife. Also, some plant communities depend on periodic fires for their survival.

### **Fire Management**

An interagency fire management team, including the NPS and DNR, has developed a fire management plan for the state of Alaska. The plan identifies the appropriate level of wildland fire suppression for all lands in Alaska. In some areas, wildland fires are actively suppressed to protect life, property, or valuable resources. In other areas, wildland fires are allowed to burn to improve habitat, decrease long-term risks of severe wildland fires, and reduce the cost of fire suppression. Different suppression levels are in place at different locations along the Stampede Road alignment. For example, the first few miles are in Critical, then there is some Full, then some Modified and, finally, most of the alignment is in Limited. New visitor facility development in the study area, and the increase in visitor use, would have implications for fire management and may entail reevaluation of these classifications by the interagency group.

**Critical Suppression Level** areas have been identified where immediate and aggressive fire suppression efforts are taken to protect life and property. Critical Suppression Level areas are typically close to residential areas.

**Full Suppression Level** areas also receive immediate suppression efforts to protect high value resources where fire may adversely impact resource management objectives. Full Suppression Level areas follow the major highways in the Tanana Basin, and where there are valuable resources close to access.

**Modified Suppression Level** areas are those with high value resources where land managers may consider trade-offs of acres burned versus suppression costs. Fires are attacked immediately, but land managers guide the suppression effort.

**Limited Suppression Level** areas are those where fire is beneficial or benign, or fire fighting costs are greater than the fire damage. In these areas, fires are monitored, but no suppression action is taken except to prevent fires from burning onto higher value land.

Fire suppression levels are reviewed annually among the agencies and major landowners. For additional information on the fire management policies, see the Alaska Interagency Wildland Fire Management Plan.

## Vegetation

The study area contains a diversity of plant communities representative of Interior Alaska, from bogs and river bottomlands through hillside woodlands, to high alpine tundra. The plant associations of the area vary dramatically with the interactions of soil characteristics, elevation, slope orientation to sun and wind, climate and fire events, water drainage, river dynamics, and location of permafrost. The major vegetation zones found in the study area are the lowlands/forested and sub-alpine zones described below.

**Lowlands/Forested zone:** Black spruce forest and woodland occupies areas underlain by permafrost, mostly north of the Alaska Range crest. The cold soil temperatures and impeded drainage found in these sites result in relatively low annual productivity and slow growth. Common understory shrubs in these areas include alder (*Alnus crispa*), dwarf birch (*Betula nana* and *Betula glandulosa*), Labrador tea (*Ledum groenlandicum*), shrub cinquefoil (*Potentilla fruticosa*), several species of willow (including *Salix arbusculoides*, *Salix glauca*, and *Salix planifolia* ssp. *pulchra*), and blueberry (*Vaccinium uliginosum*). Stands of black spruce burn periodically, and trees more than 100 years of age are uncommon (Viereck et al.1992). Black spruce is a fire-adapted species, with serotinous cones that generally require fire for seed dispersal. White spruce requires a mineral seedbed for establishment, so that recruitment of trees is generally tied to disturbance events, which is most frequently fire.

Dry and open sites in the forested zone often have high cover of kinnikinnik (*Arctostaphylos uva-ursi*), rose (*Rosa acicularis*), and soapberry (*Shepherdia canadensis*). In southerly aspects, spruce forest is gradually replaced by aspen woodland. Aspen forest is characteristic of warm, relatively-steep slopes in the Interior.

The very warmest and driest sites in the forest zone of the Interior are occupied by dry meadow and steppe-like vegetation dominated by grasses such as *Calamagrostis purpurascens* and *Poa glauca*, sagebrush (*Artemisia* spp.), scattered shrubs of juniper (*Juniperus communis*), and a variety of herbaceous perennials of the genera *Arabis*, *Erigeron*, *Pulsatilla*, and *Solidago*.

River corridors and upland areas with better drainage support more productive forest types than sites with permafrost, because of higher soil temperatures and increased nutrient availability. White spruce (*Picea glauca*) forest occupies uplands, sometimes mixed with paper birch (*Betula papyrifera*) on hillsides. Birch occupies early successional sites in relatively moist facies, while aspen (*Populus tremuloides*) is locally abundant in very dry or more xeric early succession sites. Common shrubs in upland spruce-birch forests are dwarf birch (*B. nana*), rose (*Rosa acicularis*), willows (*Salix bebbiana*), and high bush cranberry (*Viburnum edule*). Common mosses in the understory of spruce forest are *Hylocomium splendens* and *Pleurozium schreberi*.

Terraces along the major rivers support colonial herbs in newly-abandoned channels, grading into thickets of alder (*Alnus crispa*) and willow (*Salix* spp.). Older surfaces support mature balsam poplar (*Populus balsamifera*) forests, grading into closed white spruce (*Picea glauca*) forests. Black spruce and mixed black and white spruce forests occupy areas where permafrost has developed and drainage is impeded.

Interspersed within the forested zone are numerous wetland and riparian areas dominated by herbaceous taxa, including sedges, rushes, grasses, forbs, and mosses. Wetlands in this area are often topographically controlled and occupy topographic depressions, thaw features, and sites with impeded drainage. Beaver also have a considerable influence on the distribution of wetlands through the impounding of streams, particularly in the forested lowlands.

**Subalpine zone:** In the subalpine zone, roughly 2,500-4,000 feet in elevation, scrub vegetation dominated by dwarf birch (*Betula glandulosa*), alder (*Alnus crispa*), and willow (*Salix spp.*) alternates with open spruce woodland and meadow sites, depending on drainage, topography, and site history. As the upper elevational limit of trees is approached, spruce woodland becomes very open and has higher relative cover of tundra shrubs, such as blueberry (*Vaccinium uliginosum*), dwarf birch, rhododendron (*R. lapponicum*), and willows (*Salix spp.*). Common graminoid species in the shrub zone are *Arctagrostis latifolia*, *Carex bigelowii*, *Carex podocarpa*, *Carex scirpoidea*, *Festuca altaica*, and *Poa arctica*. Common forbs in this zone are arctic wormwood (*Artemisia arctica*), lupine (*Lupinus arcticus*), parrya (*Parrya nudicaulis*), coltsfoot (*Petasites spp.*), wintergreen (*Pyrola spp.*), groundsels (*Senecio atropurpureus* and *S. lugens*), and goldenrod (*Solidago multiradiata*). Dwarf shrub species that are important in this vegetation are bearberry (*Arctostaphylos alpina* and *A. rubra*), mountain avens (*Dryas spp.*), crowberry (*Empetrum nigrum*), and netted willow (*Salix reticulata*).

With the subalpine's open vistas, profusion of summer wildflowers and association with unique plants and geologic features, the high tundra is the most desirable destination for hikers and trail users. High and low bush cranberries, blueberries, cloudberries, raspberries and currants are abundant throughout the study area and berry picking is a popular activity for visitors and a major food source for wildlife.

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## Wildlife

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Large mammals include moose, caribou, wolf, brown (grizzly) and black bear, all of which cover shifting territories according to season, snow cover and available food sources. Many locations along the corridor could afford wildlife viewing opportunities. For example, beaver ponds are found in several areas and provide a common location for moose to congregate and feed.

**Moose.** Moose are common, year-round residents of the area and occur along the Stampede Road alignment at densities typical of Interior Alaska. Moose frequently occupy the valley bottoms and slough ponds in the summer, but move upward in the fall to the subalpine areas to feed on upland willows. Moose habitat also includes timberline plateaus and recently burned areas that contain willow and birch shrubs. In winter, moose gather in groups and move to lower elevations to feed on willow along rivers and sloughs. Viewing opportunities along the Stampede Road alignment would be similar to that of the Denali park road.

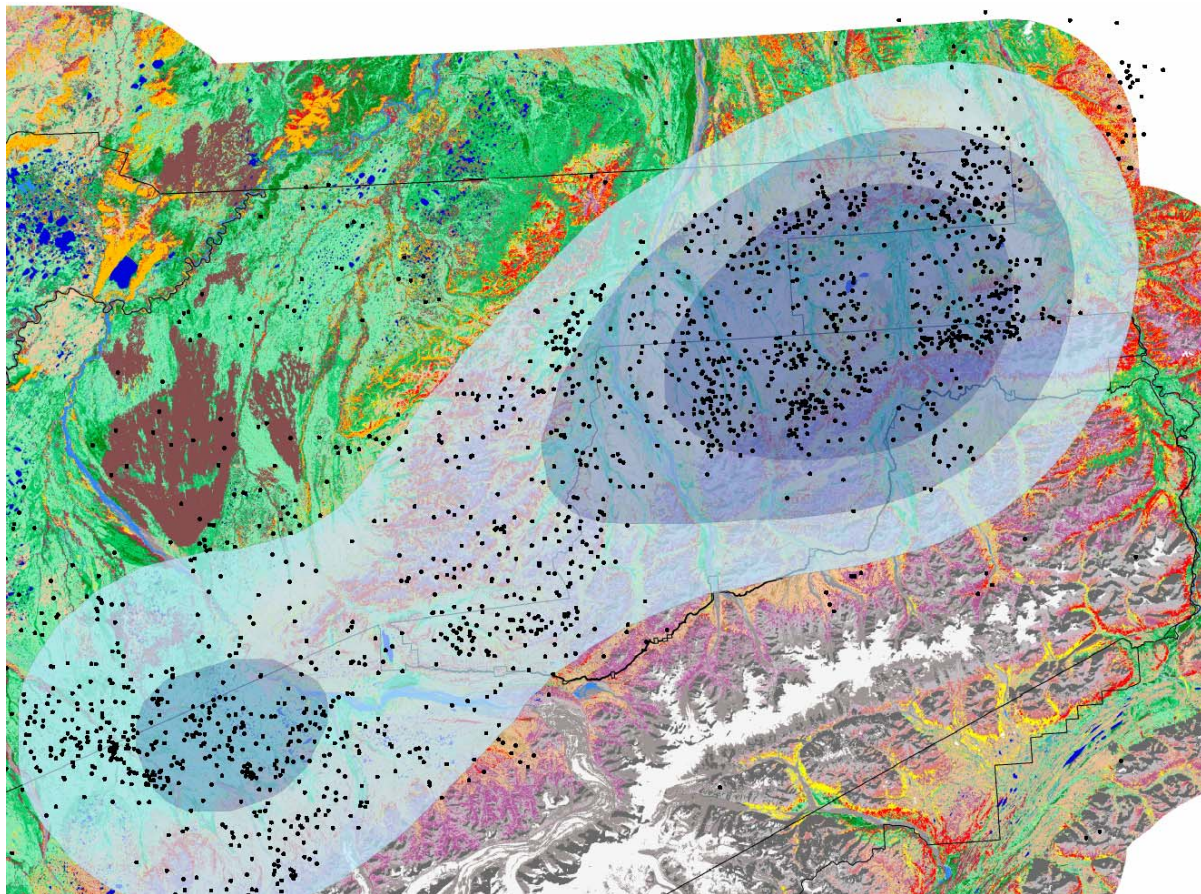
*Data needs:* Additional information on moose abundance, distribution, movements, and habitat along the corridor would be necessary.

**Caribou.** The study area has historically been a calving and important wintering area for the Denali caribou herd, which currently numbers about 1,600. The most important caribou calving

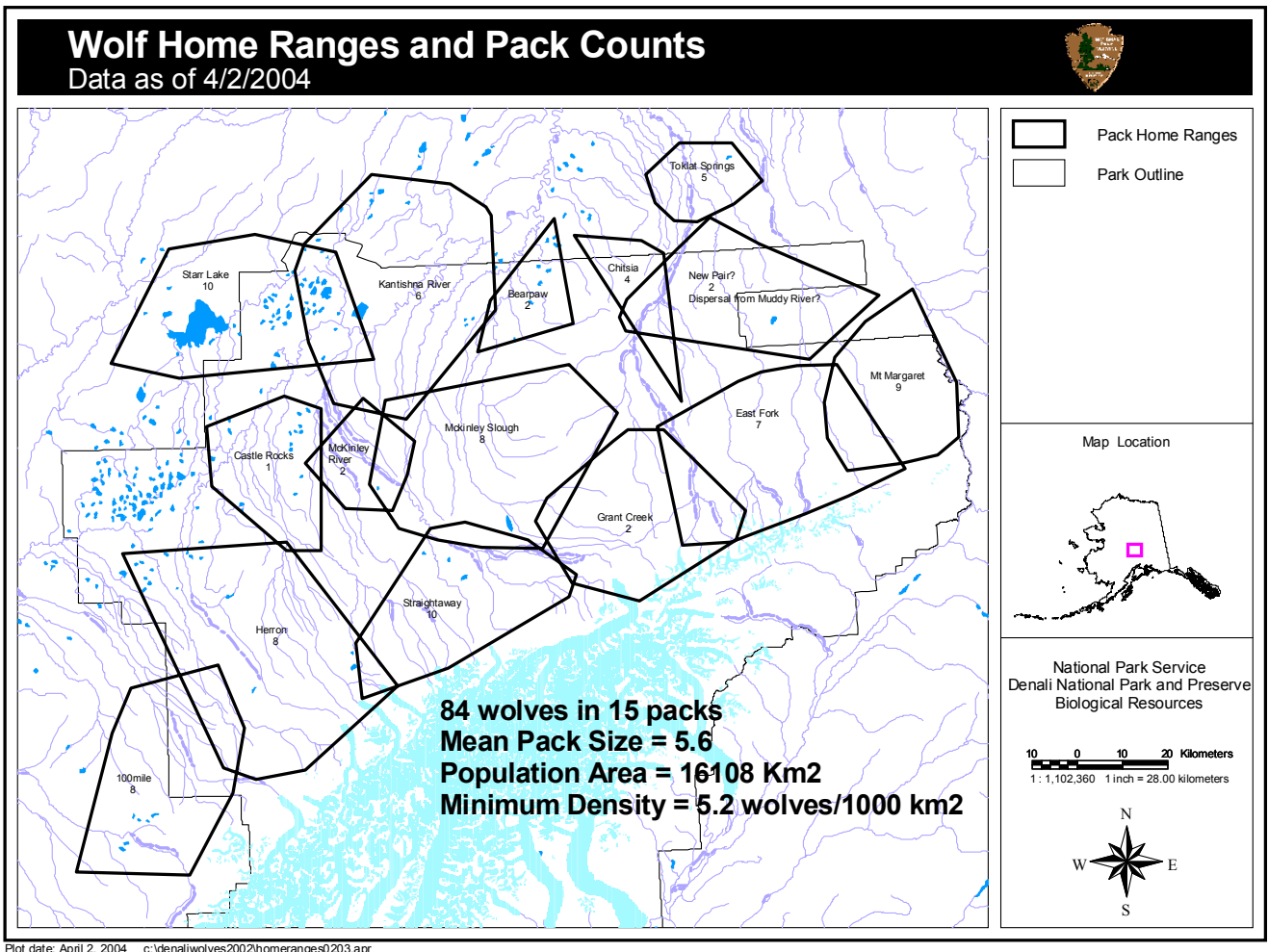
areas are south of the park road. Caribou have typically calved in rolling hills or flats along the Sushana/lower Toklat area, Stony Creek, and Moose Creek (Singer 1986), which are along the corridor route. Calving typically occurs in the lowest areas first (at Sushana and Stony) and moves to the Moose Creek area and Turtle Hill (south of study corridor). Caribou calving has also occurred on state lands near the end of the Stampede Trail (Alaska DNR 1991). Summer range includes mostly alpine-tundra-dominated mountain slopes both south of the Alaska Range (Cantwell area) and on the north side of the Alaska Range from the Teklanika River west to the Clearwater River. These areas are south of the corridor route. Rutting habitat in September-October is typically at mid-elevations in open tussock and shrub tundra in the Turtle Hill, Moose Creek, and Stony Creek areas. Historically, caribou have wintered along and adjacent to the corridor from the lower Savage River to lower Toklat River area and in the Kantishna Hills (Singer 1986).

During the summer season, chances to see caribou would be limited because caribou disperse to summer ranges south of the Denali park road. Viewing opportunities would be the highest in the winter months, when caribou would be wintering in areas along the Stampede Road alignment. See the map below for the winter distribution of caribou.

### **Winter Distribution of Caribou**



**Wolves.** Observations since 1985 indicate that about seven wolf packs have used the area adjacent to the Stampede Road alignment during this period. A wealth of information is available with Mech et al. (1996) providing information on wolf demography and distribution. Opportunities to see wolves in winter would be similar to the eastern parts of the park road in summer. Since there are few caribou and no sheep along the Stampede corridor in summer, wolf use at that time is low.



**Bear.** Both grizzly bears and black bears can be found along the corridor. Areas to the north of the Stampede Road alignment are more typical of black bear habitat while typical grizzly habitat is found south of the corridor. Grizzly densities along the Stampede corridor are likely lower than along the Clearwater Fork and Moose Creek. Hibernation occurs during the winter and can be anywhere from five to seven months. They are normally out of hibernation from approximately May 1 through October 1. Bears frequent the lowland valleys during spring and summer, then spend August and September in the uplands, feeding primarily on berries.



There would be fewer opportunities to see bears along the Stampede Road alignment than along the park road due to reduced bear densities and the greater potential for bears to be concealed by vegetation along the Stampede corridor.

*Data needs:* Additional information on bear abundance, distribution, movements, and habitat along the corridor would be necessary, especially for black bear.

### **Birds**

The study area supports a rich diversity of birds and is along a migration corridor for sandhill cranes, trumpeter and tundra swans, and various other species of waterfowl, raptors, shorebirds and passerines.

The Denali raptor nest project has collected baseline information on the breeding biology of golden eagles and other raptors in the eastern portion of the park. This study area includes a portion of the Stampede Road alignment from the Toklat River to Kantishna. McIntyre (1989) recommended aerial and ground surveys be conducted in the Kantishna Hills.

*Data Needs:* Baseline information on ground-nesting birds and raptor breeding biology (nest structures and breeding areas) should be collected within the study area.

### **Fish**

Based on a preliminary evaluation of the Stampede Road alignment, at least 17 streams cross the corridor. Most of the drainages along the corridor have never been inventoried for fisheries resources with the exception of the streams in the Kantishna area (Miller 1981 and Meyer and Kavanagh 1983). Alaska Department of Fish and Game salmon surveys provide information on some streams traversing the corridor.

Miller (1981) surveyed streams along the Denali park road, which included some work in the Kantishna area. The survey focused on determining the fish species present. Small portions of four streams in the Kantishna area were surveyed. Grayling and sculpins were reported in all streams, and king salmon fry in three streams. Meyer and Kavanagh (1983) surveyed 34 Kantishna Hills streams and tributaries in 1982. Data included species compositions, size and age structure, seasonal and spatial distribution, and relative abundance of fishes. Five species were found in the Kantishna Hills streams – arctic grayling, slimy sculpin, round whitefish, and king and chum salmon.

*Data Needs:* A field reconnaissance of all major streams within the study area should be conducted. A field survey of all potential stream crossings should be completed to identify the fish species composition, relative abundance, and life history usage (e.g., migrations, spawning, and rearing). Resident and anadromous fish spawning areas near the corridor should be identified.

### **Threatened or Endangered Species**

Preliminary investigation indicates there are no threatened or endangered species within the study area.

*Data needs:* Additional analysis would determine whether any threatened or endangered species occur in the study area and potential impacts, if any, from new north access developments.

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### **Sound Quality**

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NPS Management Policies define natural soundscapes as follows:

Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive, and can be transmitted through air, water, or solid materials.

Natural sounds are intrinsic elements of the environment that are often associated with parks and park purposes. They are inherent components of “the scenery and the natural and historic objects and wildlife” protected by the NPS Organic Act. As reported to the U.S. Congress in the “Report on the Effects of Aircraft Overflights on the National Park System,” a system-wide survey of park visitors revealed that nearly as many visitors come to national parks to enjoy the natural soundscape (91%) as come to view the scenery (93%).

Characterizing sound quality at Denali is an ongoing process. Researchers use sound level meters and digital media storage devices both to record sound level measurements in decibels (dB) and to collect digital sound recordings. The digital sound recordings are important because the NPS can determine the percent of time that particular sounds are audible and identify the source of those sounds.

In addition to natural sounds, significant human-generated sounds, such as those of aircraft and surface vehicles, intrude upon the sound quality. Because of the wilderness character of the Denali backcountry, many of the human-made sounds qualify as noise under the definition provided by the Director’s Order 47, which reads “noise is generally defined as an unwanted or undesired sounds, often unpleasant in quality, intensity or repetition.” Noise may often be the byproduct of desirable activities or machines, but it still impacts sound quality.

National Park Service researchers have collected sound data at the Stampede Airstrip from summer 2002 to spring 2004. Data collected are audio recordings and sound pressure levels. These data are currently being analyzed for the percent of time that particular sounds are audible, identifying the source of those sounds, and comparing the levels of human-made sounds relative to the natural ambient levels.

## Cultural Resources

Denali National Park and Preserve is home to a host of cultural resources that date back to the earliest period of human settlement of North America. Many of these resources are from prehistoric periods. Archeological investigations conducted in and immediately adjacent to the park strongly suggest that sites dating from the Paleoarctic tradition (11,000 years before present) through the Protohistoric period (200 years before present) exist in the park.

Several groups of Native Athabascans have a long-term historic pattern of use in Denali National Park and Preserve:

- The Ahtna people of Cantwell arrived from the east.
- The Tanana people came into the area from the north, traveling up the Nenana and Toklat Rivers.
- The Koyukon people who lived at Lake Minchumina ascended the McKinley, Foraker and Heron Rivers.
- The Upper Kuskokwim people, who still live in Nikolai and Telida, approached the park from the west.
- The Dena'ina people approached the park from the south.

The Denali backcountry most certainly includes both known and unidentified archeological resources, relating to both prehistoric and historic Athabascan Native culture. Known archeological sites along or near the Stampede road alignment include the Dry Creek, Panguingue Creek and Little Panguingue Creek sites.

The 1905 gold discoveries in the Kantishna Hills brought large numbers of prospectors and miners to the area, and settlements such as Diamond, Glacier City, and Eureka (Kantishna) developed in support of the mining activities. As the populations of Interior Alaska grew, development of transportation systems became essential. Construction of the Alaska Railroad (1915-1923) connected the southern coast of Alaska to the Interior city of Fairbanks, skirting the eastern boundary of the park, making the park much more accessible. Visitors arrived by train and headed into the park by pack train (later bus and auto), to spend a few days at Savage River Tourist Camp. The park road, constructed between 1922-1938, eventually connected the Kantishna Mining District to the railroad at McKinley Park Station and provided tourists a second destination camp at Eielson at Mile 66. The completion of the park hotel in 1939 served as the catalyst for eventually closing both the Savage River Camp and the camp at Eielson.

While much of the area of historic mining activity is in the Kantishna Hills, additional mining-related resources are scattered throughout the park. Other cultural resources in the backcountry include historic trapping and subsistence use areas with associated cabins and trails, mainly in the northwest area of the park, and linear features, such as roads, are now little more than trails, related to early transportation and access from the north. In his book entitled *Alaska's Wolf Man*, Jim Rearden tells of Frank Glaser's wolf-trapping adventures along the Savage River from 1924-1937. Remnants of Glaser's cabins and traplines are found in the area.

Numerous cultural resources have been identified along or adjacent to the study area. There are about 100 known sites along the Stampede Road alignment and the Clearwater/Myrtle and Moose Creeks. The old Eureka/Kantishna Historic Mining District is included in the study area and has been determined to be eligible for listing on the National Register of Historic Places by the Alaska State Historic Preservation Office. The Stampede Mine Historic District is in the process of being nominated for the National Register of Historic Places. The probability of other sites existing in or near the study area is high.

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## **Subsistence**

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The Alaska National Interest Lands Conservation Act (ANILCA) provides the opportunity for local, rural residents engaged in a subsistence way of life to continue to do so on federal public lands. Accordingly, Congress provided for traditional subsistence uses by local, rural residents in the 1980 ANILCA land additions to Denali National Park and Preserve, which includes the national park lands within the study area. Many Native and non-Native local, rural residents engage in, and depend upon, resources from the park and preserve for personal consumption, cultural identity, and to maintain a subsistence way of life.

Subsistence activities are dynamic and diverse with hunting usually occurring in the fall and winter months. Fishing is concentrated during the summer and fall, and trapping efforts occur in the mid- to late-winter months when snow cover is adequate for travel and fur is prime. Berry-picking and use of plant greens occur in the summer and fall months. Timber harvest typically occurs in the winter when snow cover and frozen rivers and lakes make access and transportation more efficient.

The different means and methods of subsistence access, and the seasonal timing of their use, are critical for acquiring resources and are as diverse as the resources being sought. Common methods of access include hiking, skiing, snowshoeing, dog sleds, horses, snowmobiles, motorboats or canoes, and in some cases, such as near Cantwell and in the Kantishna Hills, the use of off-road vehicles. Along the eastern region of the park, subsistence users from McKinley Village, and more recently some individuals from Cantwell, use motor vehicles for driving the park road to access the Kantishna Hills. There is no known use of airplanes by local rural subsistence users to access preserve lands for the taking of subsistence fish or wildlife.

Subsistence harvests may vary considerably from year to year due to such factors as weather, migration patterns, natural cyclic population fluctuations, or from political and regulatory factors. Although the magnitude of subsistence use was probably much greater historically than it is now in Denali, the seasonal use and relative importance of certain species are still similar today. Studies conducted from the early to mid 1980s indicate a dependence primarily on moose, caribou, rock and willow ptarmigan, spruce grouse, hare, ducks, geese, salmon, and a few species of freshwater fish. Less-frequently used large mammals include black bear, brown bear, and Dall sheep. Large mammals account for 70% of the resources used, and fish account for 21%. Important fur animals include marten, mink, red fox, wolf, lynx, weasel, wolverine, land otter, beaver, muskrat, and coyote.

## Transportation and Access

Like much of Alaska, the remote location of Denali National Park and Preserve has meant that the availability of access to the park has been the most important determining factor for the level of and type of visitor use, both in the backcountry and the frontcountry. The availability of surface transportation both to and into the park developed slowly through the twentieth century; and direct, all-weather access to the park entrance was not available until the fall of 1971 with the completion of the George Parks Highway. Much of the park remains accessible primarily by air transport.

### A Brief History of Overland Access to Kantishna

In 1905, gold discoveries on Glacier Creek sparked a stampede that opened the Kantishna Mining District and created several towns and access routes. Among the gold camps that sprang up were:

- Glacier City on the Bearpaw River
- Diamond at the mouth of Moose Creek
- Roosevelt on the Kantishna River
- Eureka (now known as Kantishna) on Moose Creek

Miners reached these camps by river and on overland trails. Some of these trails connected with each other as well, offering travelers several ways to move between camps and the creeks. Though the stampede was short-lived, mining continued in the district for the next few decades, though Eureka/Kantishna was the only community that endured.

### RS-2477 Rights-of-way

RS 2477 stands for Revised Statute 2477 from the Mining Act of 1866, which states:

*The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted.*

The act granted a public right-of-way across unreserved federal land to guarantee access as land transferred to state or private ownership. Rights-of-way were created and granted under RS 2477 until its repeal as part of the Federal Land Practices Management Act in 1976. In Alaska, federal land was "reserved for public uses" in December 1968, with passage of PLO 4582, also known as the "land freeze." For practical purposes, this date effectively ended the window of opportunity for RS 2477 qualification in Alaska.

The following trails appear in state statute (AS 19.30.400) as a state right-of-way:

- RST 340** Lignite-Stampede
- RST 341** Roosevelt-Kantishna Trail
- RST 342** Roosevelt-Glacier Trail
- RST 343** Kobi-Kantishna Trail
- RST 344** Lignite-Kantishna Trail



**RST 346** Nenana-Kantishna via Clearwater Fork Trail  
**RST 348** Spruce Creek Trail  
**RST 414** El Dorado Sled Road  
**RST 491** Rex-Roosevelt Trail  
**RST 492** Glacier-Kantishna via Caribou Creek Trail  
**RST 493** Quigley Ridge Trail

“RST” is an administrative designation by the Alaska Department of Natural Resources, meaning “revised statute trail.” Identification of RSTs does not establish validity for RS-2477 rights-of-way on federal lands. National Park Service guidance for potential RS 2477 rights-of-way is found in the 1986 *General Management Plan*.

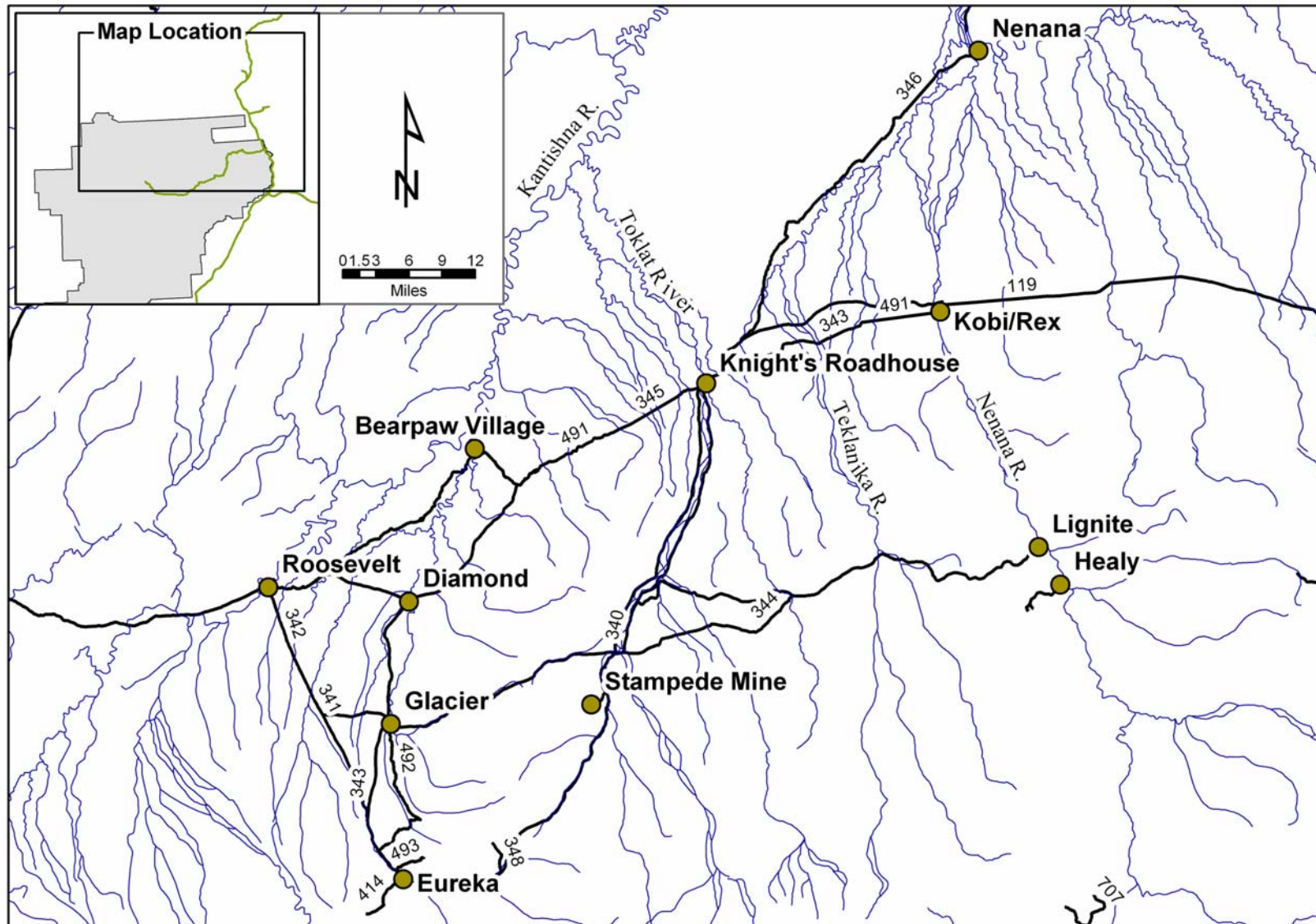
Refer to the map on page 82 for an overview of the historic mining towns and the routes used to travel throughout the area.

### **Railroad and Highways**

The Alaska Railroad was the first mode of mechanized transportation to the original Mt. McKinley National Park after the park was established in 1917. The railroad was completed in 1922, and that year there were seven visitors to the park. The railroad passes through the Alaska Range via Broad Pass and the Nenana River Canyon along the eastern edge of the Old Park. Until the Denali Highway was completed in 1957, the railroad was the only easy means of access to the park. Automobiles were carried on flat cars for use on the park road before 1957.

The park was linked to the statewide road system in 1957 with completion of the Denali Highway, a 135-mile gravel road extending northwest from Paxson on the Richardson Highway to Cantwell, 28 miles south of the park entrance. Road access to the park via this route involved a long, circuitous drive from Anchorage via the Glenn and Richardson Highways or from Fairbanks and Valdez via the Richards Highway. Road access increased visitation and, by 1962, the park was receiving more than 16,000 visits annually (NPS 1997).

Access to the park improved further in fall 1971 with the completion of the George Parks Highway. The highway linked Alaska’s two major population centers, Anchorage and Fairbanks, and provided a more direct route for buses and private vehicles to travel between the two cities. In addition, the highway improved access to the park. The main entrance of the park is approximately 240 miles north of Anchorage and 120 miles south of Fairbanks via the highway. Visitation to the park increased dramatically from that point forward – a record 88,615 recreation visits in 1972 alone (NPS 1997). Many of today’s visitors travel this route, either by commercial bus, rental vehicle, or privately-owned vehicle. In recent years, however, the proportion of visitors using the railroad, particularly those on package commercial tours, has been increasing. Out-of-state visitors reach Alaska by commercial cruise ships (42%), domestic commercial air (48%), international commercial air (1%), or personal vehicles (6%), motorcoach (1%), or by ferry on the Alaska Marine Highway (1%) (ADCED 2001).



Map of historic mining towns and early transportation corridors. Eureka was the early name for Kantishna.

### **The Park Road**

The 92-mile park road, completed to Kantishna in 1938, serves as the major access route to the interior of the Old Park and the historical community of Kantishna. The road was designed as a low-speed route for wildlife viewing. Traffic was relatively light until the completion of the Parks Highway. The first 15 miles of the road are paved and open to all traffic. Beyond Mile 15, the road is gravel and travel is restricted to tour and shuttle buses, vehicles used to access private inholdings (including businesses in Kantishna), administrative vehicles, campers driving to Teklanika Campground (minimum 3-night stay), a limited number of professional photographers, and persons issued a special use permit.

There is a seasonal limit of 10,512 vehicles allowed to travel the restricted part of the park road during the core visitor use period (May 26 – September 13) established by the 1986 *General Management Plan* and codified in NPS regulations that were published in the *Federal Register* in June 2000. The quota is allocated between tour buses, shuttle buses, private vehicles, and administrative vehicles. The restrictions and quotas are in place to protect both wildlife viewing opportunities and the wilderness character of the road.

Except for daily bus limits, no limits have been established for road use during the two shoulder seasons (May 15-25 and September 14 until road closure due to weather). From May 15-25, private vehicles and tour buses are permitted to drive as far as the Teklanika rest stop, pending weather and road conditions. During four days in September, after the shuttle bus system ceases operation, a lottery system allows up to 1,600 private vehicles (400 per day, Friday-Monday) to drive the park road to Kantishna.

### **Park Transportation Systems**

Restrictions on use of the park road began in 1972, after the completion of the George Parks Highway. That same year the National Park Service initiated a shuttle bus service to provide visitor transportation into the interior of the park while minimizing wildlife disturbance. The Visitor Transportation System (VTS) is intended to promote a leisurely park experience, with visitors getting off the bus to explore an area and then return on a later bus. However, most visitors tend to remain aboard a bus until it reaches the Eielson Visitor Center.

Since 1995, the shuttle bus system has been operated by the park concessioner, which is responsible for maintaining vehicles, providing employee food and lodging, and operating the bus system. The bus parking and maintenance areas are located in the park near the concessioner housing and administrative area. The concessioner also offers two other bus tours in addition to the park VTS: the Denali Natural History Tour and the Tundra Wildlife Tour. Passengers on these tours remain with their bus for their entire journey into the park. Both the tours and the VTS offer wildlife and scenic viewing experiences as they transport visitors through the park. In addition to access, these bus rides are the primary visitor activity at Denali.

For overnight campers in either park campgrounds or the backcountry, there are designated shuttle buses called “camper buses” that provide transportation to campgrounds or starting points for a backcountry expedition. These buses have fewer seats than standard shuttle buses so there is room to store backpacks and other camping gear. Individuals must have either a backcountry permit or a campground permit to obtain a ticket for a camper bus.

The Visitor Transportation System buses load and unload at the visitor center for the trip into the park interior. Camper buses also load at the Riley Creek Campground bus stop. Parking in the entrance area is available at several locations, with the largest lots at the Visitor Access Center, Riley Creek overflow lot (adjacent to the campground), and hotel area. Shuttle buses provide transportation in the entrance area. Courtesy shuttles are available to transport visitors to lodging facilities outside the park and the entrance area facilities. Kantishna lodging operators offer bus service from the park entrance to their facilities at the end of the park road.

### **Traffic Forecasts**

The following road and rail traffic forecasts were included in the 1997 *North Access Feasibility Study*. Estimated dollars were not updated.

**Road Traffic Forecasts.** The Alaska Department of Transportation and Public Facilities estimated an initial average daily traffic volume of 1,100 (550 vehicles traveling round-trip) on a north access road. Assuming a minimum ridership of three people per vehicle and 550 vehicles per day would result in a minimum of 1,650 people per day, or 247,500 people over a five-month (May-September) season using a north access road. Again, most visitors to the Denali area visit the park more than once during their stay, and the numbers above would represent visits, not necessarily additional visitors. This analysis does not have an allowance for buses or other forms of mass transit. The number of people using a north access road would be greater depending on the percentage of vehicles that were buses. Certainly the package tour industry would investigate using buses on a north access road.

The visitors on packaged tours are looking for the same wildlife and scenic beauty that all visitors to Alaska seek. The difference involves a desire to ensure a level of comfort and predictability in terms of transportation and accommodations. The package tour industry's use of a north access road would depend on the availability of this experience and the possibility of close proximity views of Mt. McKinley. The benefits to the package tour industry of a north access road might diminish if other opportunities for a similar experience develop (such as the proposed south side development in the Peters Hills) that possibly involve less time or lower cost. For visitors with their own transportation, a north access road would provide another choice from many other park experiences of comparable cost and commitment, such as dayhikes in the frontcountry or attending interpretive programs.

**Rail Traffic Forecasts.** At a possible ticket price of \$100 (1996 dollars) or more, a trip on a north access railroad is comparable in cost and commitment to only two other park experiences – a bus trip to Wonder Lake in the park (\$26-\$99) and a flightseeing tour (\$100-\$150+). According to NPS data for 1996, slightly more than 202,000 of the approximately 341,000 visitors to the park traveled on a bus into the park west of Primrose (mile 17). An additional 60,000 visitors traveled on the Natural History Tour to Primrose. Given that the visitor transportation systems other than this Natural History Tour (the park shuttle and the concessioner's Wilderness Tour) are operating near capacity, it is reasonable to assume that there is today at least some demand for an experience similar to that offered by a north access railroad to Kantishna/Wonder Lake. It is also reasonable to assume that some fraction of the visitors on a bus trip would have chosen to ride on a train had the option been available.

Ridership is affected by cost. In 1996 a trip to Wonder Lake on a park shuttle bus cost \$26; a narrated wildlife tour to Toklat (with a box lunch) cost \$54, and a day trip provided by a Kantishna business cost \$99. Kantishna Holdings, Inc., the Alaska Railroad corporation, and Reed Hansen & Associates all agree that a ticket price of \$100 (1996) for a north access rail trip is about the maximum the market will bear. Available time for a trip into the park is another factor that influences the decision whether to take such a trip and which trip to take. Visitors on package tours (69% of all nonresident vacation/pleasure visitors to the park are on some kind of package tour) generally have tighter schedules with less time and take shorter trips into the park. Less than 5% of the visitors currently travel to Wonder Lake (NPS 1996 road use statistics). However, as long as a variety of trip lengths remain available and a trip into the park remains cheaper than the cost of a train, it is likely that the transportation systems on the existing park road will continue to operate at capacity. Kantishna Holdings Inc. projects an annual ridership of 525,000, with 250,000 to 275,000 passengers over a 100-day summer season. Given that more visitors come to the park than use the bus systems today and the visitation to the park is projected to double in the next 14 to 18 years, a potential ridership equal to the KHI projections for the summer season will occur sometime in the next several decades.

***Off-Season Use.*** Most visitation to Alaska occurs in the summer, with only 5% of nonresident vacation/pleasure visitors arriving in the off-season. Estimating potential shoulder season and winter use of a new north access route is also difficult. The amount and type of use would depend on whether the access is open and maintained year-round. The decision to provide and maintain year-round access would depend on demand and maintenance costs. A seasonally open north access road would likely be used by residents and visitors alike as early in the spring as it would be opened. If the road were open as early as March, uses would include seeing Mt. McKinley as well as access for the typical springtime activities of skiing, dog mushing, and snowmachining. Shoulder season use of a north access road in the fall would probably focus on sightseeing and access to the state lands along the first 30 miles for hunting. Off-season use of a north access railroad would likely be the same as during the summer — sightseeing and access to lodges and businesses at the western terminus or in Kantishna. A seasonal-use road or railroad would likely increase winter use of the area by residents traveling by skis, dogsled, or snowmachine to Kantishna because the route would bypass the more difficult sections of the typical winter route.

According to the Division of Tourism AVSP data for 1995, 92,200 nonresident visitors to the state during the 1994–95 fall/winter period listed pleasure as one component of their visit. Of this number, only 28,600 visitors were in Alaska specifically for vacation/pleasure purposes (5% of all vacation/pleasure visitors for the year); the balance were either visiting friends and relatives or on combination business/pleasure trips. The growth rate for off-season vacation/pleasure visitation (31% over six years) is about half that of summer recreation visitation. Based on this data, it is unlikely that a north access route, whether by road or by rail, would have much use by nonresidents during the winter without a major marketing effort — although Kantishna Holdings Inc. projects an off-season ridership of 250,000 once all the facilities and marketing mechanisms are in place. Currently, the Alaska Railroad Corporation offers weekly passenger service between Anchorage and Fairbanks and to the park in the winter. This train consists of one passenger car and one baggage car.



Thus, winter use of any new north access route by nonresidents would probably be minimal without a major marketing effort and a large increase in winter visitation to the state.

## **Socioeconomics**

The Denali Borough was incorporated on December 7, 1990, as a home-rule borough. The borough provides limited services to its residents, including planning, education, and administration. The borough encompasses 12,780 square miles (8,179,200 acres) and includes the entire study area for the North Access Visitor Facilities Study. Most of Denali National Park and Preserve is located in the Denali Borough. The borough is largely rural, with most lands undeveloped and used for dispersed recreational and subsistence activities.

The Alaska Railroad was constructed in the 1920s and the George Parks Highway was completed in 1971. The establishment of the Clear Early Missile Warning Station (U.S. Air Force) near Anderson, the Usibelli Coal Mine near Healy, and tourism associated with Denali National Park and Preserve have brought growth and development to the area.

### **Healy**

Healy is located approximately 12 miles north of the entrance to Denali National Park and Preserve. The community of Healy began as a mining camp in 1905. In the 1920s, Healy established itself as a coal-mining town located at the confluence of Healy Creek and the Nenana River. The Usibelli Coal Mine began in 1943 and helped to further the community's development. Since the construction of the George Parks Highway, the commercial center of town has moved away from the river and railroad to the junction of the highway and the Healy Spur road. The Tri-Valley subdivision, built on leased land belonging to the Alaska Railroad, comprises the central residential area and other residents live in subdivisions at Otto Lake, along Dry Creek, and in the state subdivision along the Stampede Road.

### **Kantishna**

Kantishna, also known as Eureka after the nearby stream, was established as a gold mining camp in 1905, two years after Judge James Wickersham discovered gold in Kantishna Hills. There remain a few patented and unpatented mining properties, although future mining activity is unlikely. The area is now primarily developed as a seasonal tourist destination and has no year-round residents.

Kantishna is the site of four major lodges that operate during the summer: Denali Backcountry Lodge, Kantishna Roadhouse, Camp Denali, and North Face Lodge. The latter two are owned and operated by the same company. Additional seasonal residents include National Park Service personnel nearby at Wonder Lake and a few inholders.

### **Economy and Employment**

The Denali Borough has a diverse economy for a rural community. Major sources of employment include the Clear Air Force Station near Anderson, the Usibelli Coal Mine and the associated Golden Valley Electric Associate (GVEA) coal-fired power plant in Healy, Denali National Park and Preserve, and tourism businesses that depend on visitation to the national park.

Federal employment through the National Park Service is one of the underpinnings of employment in the central part of the borough – particularly for the Healy and McKinley Park areas. The National Park Service also hires a significant number of seasonal employees from both the local community and elsewhere.

The tourism industry is the driving force behind employment growth in the borough, although the growth is scattered among several different economic sectors. Hotels, restaurants, transport services, retail shops, gas stations, and guide services are among the many services available for visitors to the Denali Borough. In 1980, the National Park Service counted just 133 hotel rooms near the park’s entrance. By 2000, there were 1,800 rooms, not including 339 cabins and 569 RV spaces (excluding campsites and RV sites in the park).

**Population Growth in the Denali area.**

